

# Partnership for Advancing Technologies in Housing

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## *Program Announcement*

***NSF 01-45***

DIRECTORATE FOR ENGINEERING  
DIVISION OF CIVIL AND MECHANICAL SYSTEMS

**DEADLINE(S): April 17, 2001**



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# SUMMARY OF PROGRAM REQUIREMENTS

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## GENERAL INFORMATION

**Program Title:** Partnership for Advancing Technologies in Housing

**Synopsis of Program:** The Engineering Directorate of the National Science Foundation (NSF) announces a research initiative in support of the Federal Partnership for Advancing Technology in Housing, or PATH. The objectives of PATH are to improve the quality, affordability, durability, environmental performance, and energy efficiency of today's new and existing homes; strengthen the technology infrastructure of the United States; and help create the next generation of American housing. These goals are extraordinarily ambitious. The purpose of this announcement is to support fundamental research that contributes to the achievement of the PATH objectives. This initiative will focus on the application of a broad array of engineering sciences and technologies-with particular emphasis on the three technology "portfolios" identified by PATH's Roadmapping efforts and on unique local partnerships for improving housing innovation-and will encourage cooperative and interdisciplinary activities.

**Cognizant Program Officer(s):**

- John B. Scalzi, Program Director, Engineering, Division of Civil and Mechanical Systems, 545, telephone: 703-292-7020, e-mail: [jscalzi@nsf.gov](mailto:jscalzi@nsf.gov).
- R. Rajurkar, Program Director, Engineering, Design, Manufacture and Industrial Innovation, 529, telephone: 703-292-7079, e-mail: [rrajurka@nsf.gov](mailto:rrajurka@nsf.gov).
- Rajinder Khosla, Acting Division Director, Engineering, Electrical and Communication Systems, 675, telephone: 703-292-8339, e-mail: [rkhosla@nsf.gov](mailto:rkhosla@nsf.gov).
- Robert Wellek, Deputy Division Director, Engineering, Chemical and Transport Systems, 525, telephone: 703-292-8370, e-mail: [rwellek@nsf.gov](mailto:rwellek@nsf.gov).
- Frederick A. Thompson, Program Director, Engineering, Bioengineering and Environmental Systems, 565, telephone: 703-292-7947, e-mail: [athompso@nsf.gov](mailto:athompso@nsf.gov).

**Applicable Catalog of Federal Domestic Assistance (CFDA) Number(s):**

- 47.041 --- Engineering

## ELIGIBILITY INFORMATION

- **Organization Limit:** Proposals may be submitted by U.S. academic institutions in support of individual investigators or small groups.
- **PI Eligibility Limit:** None

- **Limit on Number of Proposals:** None

## **AWARD INFORMATION**

- **Anticipated Type of Award:** Standard Grant
- **Estimated Number of Awards:** 12
- **Anticipated Funding Amount:** A minimum of \$1.5 million in FY 2001, subject to availability of funds.

## **PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS**

### ***A. Proposal Preparation Instructions***

- **Full Proposal Preparation Instructions:** Standard Preparation Guidelines
  - Standard GPG Guidelines apply.

### ***B. Budgetary Information***

- **Cost Sharing Requirements:** Statutory Cost Sharing (1%) is required
- **Indirect Cost (F&A) Limitations:** Not Applicable.
- **Other Budgetary Limitations:** Total funding up to \$150,000 per project.

### ***C. Deadline/Target Dates***

- **Letter of Intent Due Date(s):** None
- **Preproposal Due Date(s):** None
- **Full Proposal Due Date(s):** April 17, 2001

### ***D. FastLane Requirements***

- **FastLane Submission:** Full Proposal Required
- **FastLane Contact(s):**
  - Kimberly Bryant, Engineering, Civil and Mechanical Systems, 545, telephone: 703-292-7006, e-mail: [kbryant@nsf.gov](mailto:kbryant@nsf.gov).

## **PROPOSAL REVIEW INFORMATION**

- **Merit Review Criteria:** National Science Board approved criteria. Additional merit review considerations apply. Please see the full program announcement/solicitation for further information.

## **AWARD ADMINISTRATION INFORMATION**

- **Award Conditions:** Standard NSF award conditions apply.
- **Reporting Requirements:** Standard NSF reporting requirements apply.

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## I. INTRODUCTION

The Directorate for Engineering of the National Science Foundation (NSF) announces a research initiative in support of the President's Partnership for Advancing Technology in Housing, or PATH. The PATH program was formally launched by the Federal government on May 4, 1998. Congress charged HUD with cooperating with other Federal agencies and the housing industry, and to engage in PATH activities that will provide research, development, testing, and engineering protocols for building materials and methods.

The objectives of PATH are to improve the quality, affordability, durability, environmental performance, and energy efficiency of today's new and existing homes; strengthen the technology infrastructure of the United States; and help create the next generation of American housing. The next decade will require the development and deployment-using voluntary approaches-of technologies, housing components, designs, and production methods that will result in housing that will accomplish the following specific PATH goals:

- Reduce the monthly cost of new housing by 20 percent or more;
- Improve durability and reduce maintenance costs by 50 percent;
- Cut the environmental impact and energy use of new housing by 50 percent and reduce energy use in at least 15 million existing homes by 30 percent or more;
- Reduce the risk of life, injury, property destruction from natural hazards by at least 10 percent, and reduce residential construction work illness and injuries by at least 20 percent.

PATH's Technology Roadmapping effort has identified the following specific areas of technical research for critical focus.

- Information technology to accelerate and streamline home building;
- Advanced panel systems;
- Whole-house and building process redesign.

In addition to proposals in the above areas of technology and technology management, NSF and PATH are also interested in proposals involving partnerships between research institutions, industrial enterprises, local government, and/or other broadly-defined research and development participants relevant to the home building industry. The submitting institution must serve as the lead institution or partner in such a partnership. Partners may include but are not limited to other academic institutions, not-for-profit institutions, private sector firms, entrepreneurs, venture capitalists, state and local government entities, trade and professional associations, and federal laboratories. At a minimum, proposed Partnerships must include an academic institution, a private sector organization, and a state/local government entity. These partnerships may capitalize on the shared interests of the partners, create new models for integrating research and development, enable small- and medium-sized firms to utilize academic resources, strengthen the capabilities of academic institutions for addressing site-specific technology innovation concerns.

## **II. PROGRAM DESCRIPTION**

The purpose of this solicitation is to support fundamental research that can help to advance the PATH goals enumerated in the earlier section. PATH's strategies to address these goals include:

- Developing the fundamental research base for housing technologies;
- Stimulating the industrial development of these technologies;
- Increasing the utilization of advanced technologies in today's new and existing homes;
- Strengthening the technological environment and context for housing in the United States.

The National Science Foundation is assisting the PATH program by supporting fundamental and exploratory research efforts that hold the most promise for advancing the PATH goals.

This initiative will focus on the application of a broad array of engineering sciences, technologies, and industrial processes, and will encourage cooperative and interdisciplinary activities. Far reaching exploratory research that can lead to breakthrough technologies and engage transcendent technologies is encouraged. Researchers are advised to visit the ENG web-site ([www.eng.nsf.gov/programs/nsf01-45.html](http://www.eng.nsf.gov/programs/nsf01-45.html)) for updates on this initiative, and to visit the PATH web page ([www.pathnet.org](http://www.pathnet.org)) and PATH Roadmapping web page ([roadmap.nahbrc.org](http://roadmap.nahbrc.org)).

Proposed research projects should contribute to the advancement of at least one PATH goal by addressing one of the three PATH Technology roadmapping fields (information technology, panelized systems, and whole-building design for home building). Innovative partnerships with local industry for research are also invited. It is anticipated that cooperation among researchers from different disciplines will open new avenues of research and develop new applications. Each research proposal should identify potential areas of application and potential impacts.

This program offers a unique opportunity to investigators to request funding for innovative and interdisciplinary research directed towards developing advanced technologies and methods for housing.

All proposals should address the ways in which education and training are integrated within the research program. Efforts to incorporate interdisciplinary education experience and encourage student teamwork are also encouraged.

## **III. ELIGIBILITY INFORMATION**

Proposals may be submitted by U.S. academic institutions in support of individual investigators or small groups. Only one proposal may be submitted by a Principal Investigator. A Principal Investigator for one proposal may be a co-Principal Investigator on other proposals.

## **IV. AWARD INFORMATION**

NSF anticipates that \$1.5 million will be available in FY 2001 for this initiative. NSF anticipates funding awards for up to 24 month duration with a maximum of \$150,000 per project. The final number of awards will be subject to the availability of funds and the quality of the proposals. The



anticipated date of awards will be July/August 2001.

## **V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS**

### **A. Proposal Preparation Instructions**

#### **Full Proposal Instructions:**

Proposals submitted in response to this program announcement/solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF *Grant Proposal Guide* (GPG). The complete text of the GPG is available electronically on the NSF Web Site at: <http://www.nsf.gov/cgi-bin/getpub?nsf012>. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (301) 947-2722 or by e-mail from [pubs@nsf.gov](mailto:pubs@nsf.gov).

Proposers are reminded to identify the program solicitation number (NSF 01-45 ) in the program announcement/solicitation block on the NSF Form 1207, *Cover Sheet For Proposal to the National Science Foundation*. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

### **B. Budgetary Information**

In accordance with Congressional requirements (see GPM 330), NSF requires that each awardee share in the cost of research projects resulting from unsolicited proposals. For purposes of NSF, proposals submitted in response to this announcement are considered unsolicited. The awardee may meet the statutory cost sharing requirement by choosing either of two alternatives: (1) by cost sharing a minimum of one percent on the project; or (2) by cost sharing a minimum of one percent on the aggregate costs of all NSF-supported projects requiring cost sharing.

The minimum one percent statutory cost sharing requirement discussed above need NOT be entered on Line M of the proposal budget.

***Other Budgetary Limitations:*** Total funding up to \$150,000 per project.

### **C. Deadline/Target Dates**

Proposals submitted in response to this announcement/solicitation must be submitted by 5:00 PM, local time on the following date(s):

April 17, 2001

### **D. FastLane Requirements**

Proposers are required to prepare and submit all proposals for this Program Announcement through the FastLane system. Detailed instructions for proposal preparation and submission via FastLane are available at: <http://www.fastlane.nsf.gov/a1/newstan.htm>. For FastLane user support, call 1-800-673-6188.

*Submission of Signed Cover Sheets.* The signed copy of the proposal Cover Sheet (NSF Form 1207) must be postmarked (or contain a legible proof of mailing date assigned by the carrier) within five working days following proposal submission and be forwarded to the following address:

National Science Foundation  
DIS – FastLane Cover Sheet  
4201 Wilson Blvd.  
Arlington, VA 22230

## **VI. PROPOSAL REVIEW INFORMATION**

### **A. NSF Proposal Review Process**

Reviews of proposals submitted to NSF are solicited from peers with expertise in the substantive area of the proposed research or education project. These reviewers are selected by Program Officers charged with the oversight of the review process. NSF invites the proposer to suggest at the time of submission, the names of appropriate or inappropriate reviewers. Care is taken to ensure that reviewers have no conflicts with the proposer. Special efforts are made to recruit reviewers from non-academic institutions, minority-serving institutions, or adjacent disciplines to that principally addressed in the proposal.

Proposals will be reviewed against the following general review criteria established by the National Science Board. Following each criterion are potential considerations that the reviewer may employ in the evaluation. These are suggestions and not all will apply to any given proposal. Each reviewer will be asked to address only those that are relevant to the proposal and for which he/she is qualified to make judgements.

#### **What is the intellectual merit of the proposed activity?**

How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of the prior work.) To what extent does the proposed activity suggest and explore creative and original concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

#### **What are the broader impacts of the proposed activity?**

How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?

Principal Investigators should address the following elements in their proposal to provide reviewers with the information necessary to respond fully to both of the above-described NSF merit review criteria. NSF staff will give these elements careful consideration in making funding decisions.

### ***Integration of Research and Education***

One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the diversity of learning perspectives.

### ***Integrating Diversity into NSF Programs, Projects, and Activities***

Broadening opportunities and enabling the participation of all citizens -- women and men, underrepresented minorities, and persons with disabilities -- is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

### **Additional Review Criteria**

How well does the research activity contribute to the advancement of at least one PATH goal by addressing one of the three PATH Technology roadmapping fields (information technology, panelized systems, and whole-building design for home building)?

A summary rating and accompanying narrative will be completed and signed by each reviewer. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers, are sent to the Principal Investigator/Project Director by the Program Director. In addition, the proposer will receive an explanation of the decision to award or decline funding.

## **B. Review Protocol and Associated Customer Service Standard**

All proposals are carefully reviewed by at least three other persons outside NSF who are experts in the particular field represented by the proposal. Proposals submitted in response to this announcement/solicitation will be reviewed by Panel Review.

Reviewers will be asked to formulate a recommendation to either support or decline each proposal. The Program Officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation.

NSF will be able to tell applicants whether their proposals have been declined or recommended for funding within six months for 95 percent of proposals. The time interval begins on the proposal deadline or target date or from the date of receipt, if deadlines or target dates are not used by the program. The interval ends when the Division Director accepts the Program Officer's recommendation.

In all cases, after programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial, and policy implications and the processing and issuance of a grant or other agreement.

Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at its own risk.

## **VII. AWARD ADMINISTRATION INFORMATION**

### **A. Notification of the Award**

Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program Division administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See section VI.A. for additional information on the review process.)

### **B. Award Conditions**

An NSF award consists of: (1) the award letter, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable award conditions, such as Grant General Conditions (NSF-GC-1)\* or Federal Demonstration Partnership (FDP) Terms and Conditions \* and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreement awards also are administered in accordance with NSF Cooperative Agreement Terms and Conditions (CA-1). Electronic mail notification is the preferred way to transmit NSF awards to organizations that have electronic mail capabilities and have requested such notification from the Division of Grants and Agreements.

\*These documents may be accessed electronically on NSF's Web site at [http://www.nsf.gov/home/grants/grants\\_gac.htm](http://www.nsf.gov/home/grants/grants_gac.htm). Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (301) 947-2722 or by e-mail from [pubs@nsf.gov](mailto:pubs@nsf.gov).

More comprehensive information on NSF Award Conditions is contained in the NSF *Grant Policy Manual* (GPM) Chapter II, available electronically on the NSF Web site at <http://www.nsf.gov/cgi-bin/getpub?gpm>. The GPM is also for sale through the Superintendent of Documents, Government Printing Office (GPO), Washington, DC 20402. The telephone number at GPO for subscription information is (202) 512-1800. The GPM may be ordered through the GPO Web site at <http://www.gpo.gov>.

### **C. Reporting Requirements**

For all multi-year grants (including both standard and continuing grants), the PI must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period.

Within 90 days after the expiration of an award, the PI also is required to submit a final project report. Approximately 30 days before expiration, NSF will send a notice to remind the PI of the requirement to file the final project report. Failure to provide final technical reports delays NSF review and processing of pending proposals for that PI. PIs should examine the formats of the required reports in advance to assure availability of required data.

NSF has implemented an electronic project reporting system, available through FastLane. This system permits electronic submission and updating of project reports, including information on project participants (individual and organizational), activities and findings, publications, and other specific products and contributions. PIs will not be required to re-enter information previously provided, either with a proposal or in earlier updates using the electronic system.

## VIII. CONTACTS FOR ADDITIONAL INFORMATION

General inquiries regarding Partnership for Advancing Technologies in Housing should be made to:

- John B. Scalzi, Program Director, Engineering, Division of Civil and Mechanical Systems, 545, telephone: 703-292-7020, e-mail: [jscalzi@nsf.gov](mailto:jscalzi@nsf.gov).
- R. Rajurkar, Program Director, Engineering, Design, Manufacture and Industrial Innovation, 529, telephone: 703-292-7079, e-mail: [rrajurka@nsf.gov](mailto:rrajurka@nsf.gov).
- Rajinder Khosla, Acting Division Director, Engineering, Electrical and Communication Systems, 675, telephone: 703-292-8339, e-mail: [rkhosla@nsf.gov](mailto:rkhosla@nsf.gov).
- Robert Wellek, Deputy Division Director, Engineering, Chemical and Transport Systems, 525, telephone: 703-292-8370, e-mail: [rwellek@nsf.gov](mailto:rwellek@nsf.gov).
- Frederick A. Thompson, Program Director, Engineering, Bioengineering and Environmental Systems, 565, telephone: 703-292-7947, e-mail: [athompso@nsf.gov](mailto:athompso@nsf.gov).

For questions related to the use of FastLane, contact:

- Kimberly Bryant, Engineering, Civil and Mechanical Systems, 545, telephone: 703-292-7006, e-mail: [kbryant@nsf.gov](mailto:kbryant@nsf.gov).

## IX. OTHER PROGRAMS OF INTEREST

The NSF *Guide to Programs* is a compilation of funding for research and education in science, mathematics, and engineering. The NSF *Guide to Programs* is available electronically at <http://www.nsf.gov/cgi-bin/getpub?gp>. General descriptions of NSF programs, research areas, and eligibility information for proposal submission are provided in each chapter.

Many NSF programs offer announcements or solicitations concerning specific proposal requirements. To obtain additional information about these requirements, contact the appropriate NSF program offices. Any changes in NSF's fiscal year programs occurring after press time for the *Guide to Programs* will be announced in the NSF [E-Bulletin](http://www.nsf.gov/home/ebulletin), which is updated daily on the NSF web site at <http://www.nsf.gov/home/ebulletin>, and in individual program announcements/solicitations. Subscribers can also sign up for NSF's [Custom News Service](http://www.nsf.gov/home/cns/start.htm) (<http://www.nsf.gov/home/cns/start.htm>) to be notified of new funding opportunities that become available.

## **ABOUT THE NATIONAL SCIENCE FOUNDATION**

The National Science Foundation (NSF) funds research and education in most fields of science and engineering. Awardees are wholly responsible for conducting their project activities and preparing the results for publication. Thus, the Foundation does not assume responsibility for such findings or their interpretation.

NSF welcomes proposals from all qualified scientists, engineers and educators. The Foundation strongly encourages women, minorities and persons with disabilities to compete fully in its programs. In accordance with Federal statutes, regulations and NSF policies, no person on grounds of race, color, age, sex, national origin or disability shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving financial assistance from NSF (unless otherwise specified in the eligibility requirements for a particular program).

Facilitation Awards for Scientists and Engineers with Disabilities (FASSED) provide funding for special assistance or equipment to enable persons with disabilities (investigators and other staff, including student research assistants) to work on NSF-supported projects. See the program announcement/solicitation for further information.

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation about NSF programs, employment or general information. TDD may be accessed at (703) 292-5090, FIRS at 1-800-877-8339.

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## **PRIVACY ACT AND PUBLIC BURDEN STATEMENTS**

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to applicant institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to

complete assigned work; to other government agencies needing information as part of the review process or in order to coordinate programs; and to another Federal agency, court or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 63 Federal Register 267 (January 5, 1998), and NSF-51, "Reviewer/Proposal File and Associated Records," 63 Federal Register 268 (January 5, 1998). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

Pursuant to 5 CFR 1320.5(b), an agency may not conduct or sponsor, and a person is not required to respond to an information collection unless it displays a valid OMB control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding this burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to: Suzanne Plimpton, Reports Clearance Officer, Information Dissemination Branch, Division of Administrative Services, National Science Foundation, Arlington, VA 22230, or to Office of Information and Regulatory Affairs of OMB, Attention: Desk Officer for National Science Foundation (3145-0058), 725 17th Street, N.W. Room 10235, Washington, D.C. 20503.

*OMB control number:* 3145-0058.